Appl. No. 10/554,010
Response to Office Action of January 29, 2009

PATENT
Docket No.: NL030489US1
Customer No. 000024737

Amendment to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (currently amended) A method for classifying at least one audio signal into at least one audio class, the method comprising the steps of:

analyzing said audio signal to extract at least one predetermined audio feature;

performing a frequency analysis on a set of values of said extracted predetermined audio feature at different time instances resulting in a power spectrum of said extracted predetermined audio feature;

deriving at least one further audio feature representing a temporal behavior of said extracted predetermined audio feature by parameterizing said power spectrum, wherein parameterizing said power spectrum comprises summarizing a frequency axis of the power spectrum by summing energy within at least one predetermined frequency band and dividing the summed energy within the at least one predetermined frequency band by an average of subsequent values of said extracted predetermined audio feature to yield a relative modulation depth; and

classifying said audio signal based on said further audio feature.

2. (previously presented) The method as claimed in claim 1, wherein said at least one predetermined audio feature comprises at least one of the following audio features:

root-mean-square level;

spectral centroid;

bandwidth;

zero-crossing rate;

spectral roll-off frequency;

band energy ratio;

delta spectrum magnitude;

pitch; and

pitch strength.

3. (previously presented) The method as claimed in claim 1, wherein said predetermined audio feature comprises at least one mel-frequency cepstral coefficient.

4. (previously presented) The method as claimed in claim 1, wherein said predetermined audio feature comprises at least one of the psycho-acoustic audio features loudness and sharpness.

5. (previously presented) The method as claimed in claim 1, wherein said deriving step comprises the steps of:

calculating an average value of said set of values of said extracted predetermined audio feature at different time instances;

defining at least one frequency band;

calculating the amount of energy within said frequency band from said frequency analysis; and

defining said further audio feature as said amount of energy divided by said average value.

6. (previously presented) The method as claimed in claim 5, wherein at least one of the following modulation frequency bands are used in said parameterizing said power spectrum:

1-2 Hz;

3-15 Hz; and

20-150 Hz.

7. (previously presented) The method as claimed in claim 1, wherein said at least one further audio feature is defined as at least one coefficient obtained by performing a discrete cosine transformation on the result of said frequency analysis.

8. (currently amended) A system for classifying at least one audio signal into at least one audio class, the system comprising:

 means for analyzing said audio signal to extract at least one predetermined audio feature;

 means for performing a frequency analysis on a set of values of said extracted predetermined audio feature at different time instances resulting in a power spectrum of said extracted predetermined audio feature;

 means for deriving at least one further audio feature representing a temporal behavior of said extracted predetermined audio feature by parameterizing said power spectrum, wherein parameterizing said power spectrum comprises summarizing a frequency axis of the power spectrum by summing energy within at least one predetermined frequency band and dividing the summed energy within the at least one predetermined frequency band by an average of subsequent values of said extracted predetermined audio feature to yield a relative modulation depth; and

 means for classifying said audio signal based on said further audio feature.

9. (previously presented) A music system comprising:

 means for playing audio data from a medium; and

 a system as claimed in claim 8 for classifying said audio data.

10. (previously presented) A multi-media system comprising:

 means for playing audio data from a medium;

 a system as claimed in claim 8 for classifying said audio data;

 means for displaying video data from a further medium;

means for analyzing said video data; and

means for combining the results obtained from analyzing said video data with the results obtained from classifying said audio data.

11-12. (canceled)

13. (previously presented) The method as claimed in claim 1, wherein performing a frequency analysis on a set of values of said extracted predetermined audio feature at different time instances results in a log power spectrum of said extracted predetermined audio feature.